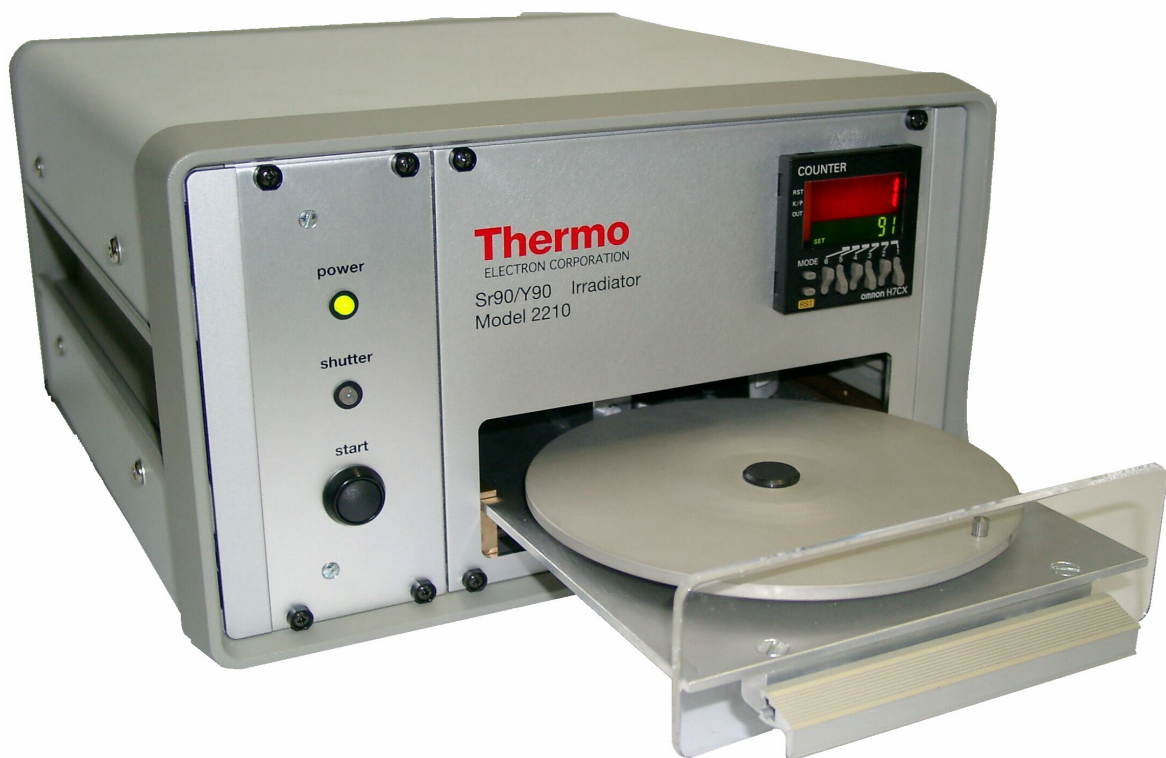


Instrument Manual

Sr90/Y90 TLD-IRRADIATOR MODELL 2013

Serial-No.: 2013001/00....

TLD-Irradiator serves the calibration of
TLD chips, -sticks or maps.



0. Prefaces

Contents and purpose

This manual serves for the support of the instructed personnel for
operation TLD-Irradiators

and to the guarantee of its employment fitness.

References

In this manual the references have

Caution, Attention and Note

the following meaning:

Caution: This heading is used, if inaccurate obeying or disregarding of instructions or procedures can lead to injuries.

Attention: This heading is used, if inaccurate obeying or disregarding of instructions or procedures can lead of the damage of the equipment.

Note: This heading is used, if one makes attention to special peculiarities.

1. Range of application

The Tld-irradiator MODELS 2210 is a versatile calibration system and serves the calibration of TLD chips, - sticks with 2, 3 or 4 elements.

For this is a Sr90/Y90 radiation source used by 33 MBq (0.9mCi) with an activity.

The equipment can be operated both at a 230V/50Hz and at a 115V/60Hz alternating voltage system.

2. Technical manual

TLD-Irradiator is built in a portable condition housing.

The front side of the housing contains the following modules from on the left of to the right:

- the electronic tax and control unit
- the thrust subject
- the calibration factor announcement.

On the back is a cold equipment installation plug in combination with the in out rocker switch, the safeguard subject and the voltage switch as slidegate valve.

On the front side of the tax and control unit are LED displays:

- One also, „**power**” designated green LED, which indicates whether the equipment is switched on.
- One also, „**more shutter**” designated white 3-Farben-LED-Anzeige to optical control of the Device status.
- A tracer with the designation , is started „**start**” which procedure the calibration.

On the right side of the equipment are the thrust subject and the counter.

The thrust subject can be equipped with carrier disks. There are 3 different types:

- Combination disk for 50 chips and rods
- Disk for 50 micro cubes
- Disk for 5 TLD maps

On the front of the counter are keys for adjusting the counter value.

Example: the disk turns in the Irradiator with a speed of 1 revolution/minute.
If 90 revolutions are necessary for the irradiation, the counter desired value must be adjusted to 90.

The counter counts the revolutions by a pulse generator and increases its actual value around 1 by each impulse.

If the counter resembling and the output contact are the same the calibration procedure switches off. The carrier disk in the thrust subject is located in basic position, the LED display, shutter shines green and an acoustic signal sounds.

The counter desired value of the input field should indicate at least the value to 1.

The carrier disk can be taken off after opening the thrust subject. After pressing of the key, „reset” at the counter the equipment is ready for a further calibration procedure.

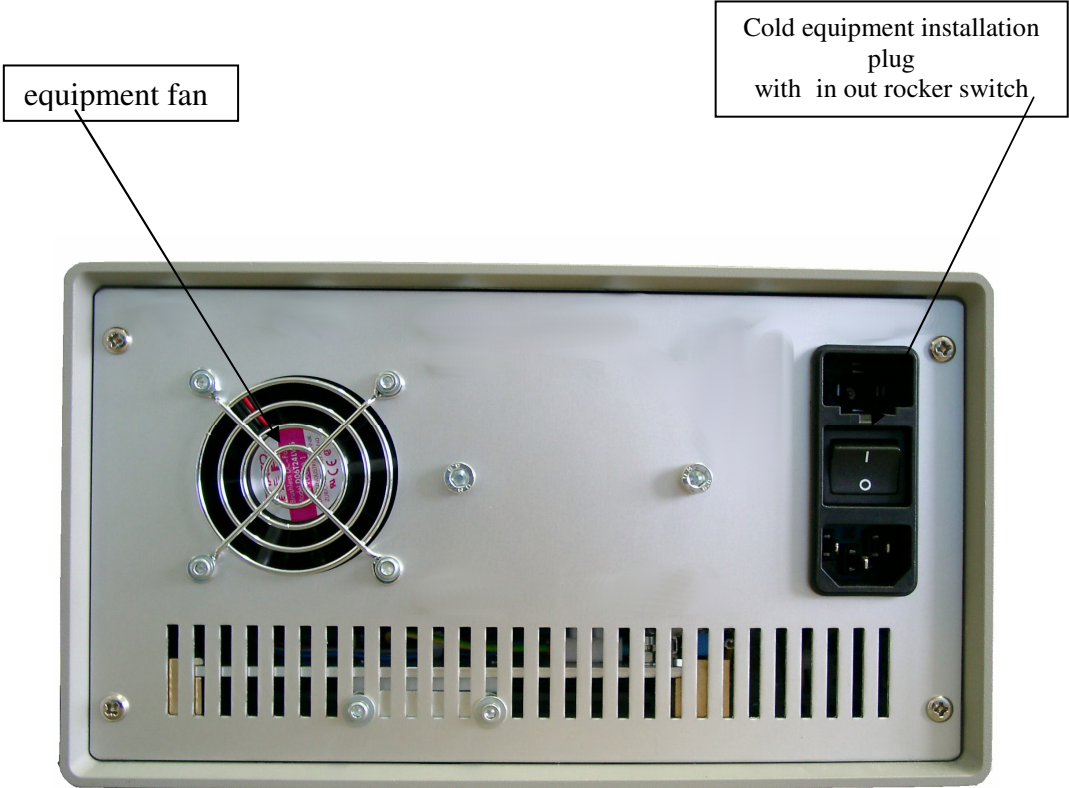
During the calibration procedure the disk, propelled by an alternating current synchronous geared motor, turns with the elements which can be illuminated continuously under the opened source screen.

With a frequency of 50 cycles per second the speed 1 rotation / minute is.

With a frequency of 60 cycles per second the speed 1.2 rotations / minute is.

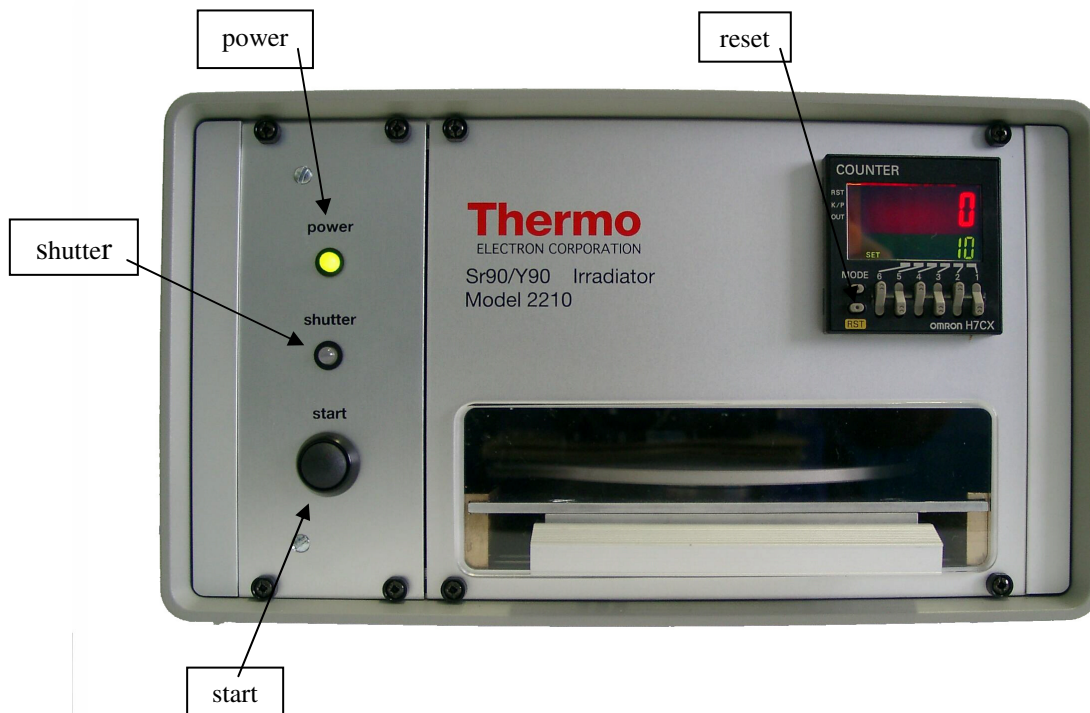
If one opens the thrust subject during the process, the drive stops, the source screen is closed.

On the back a cold equipment installation plug is combined with an in out rocker switch. Here furthermore is a safeguard subject with two contact-voltage-proof fuse holders inserted. At a mains voltage change over switch are the tensions 230V/50Hz and 115V/60Hz selectable.



2.1 Function of the serving and indicators

Serving and/or indicating	Position/ announcement	Result / Function
green LED „power“	does not shine	Equipment switched off
	shines	Equipment switched on
white LED „shutter“	does not shine	Map disk not in basic position shutter closed
	shines green	Map disk in basic position shutter closed
	shines red	Map disk does not turn shutter after start did not open Map disk turns
	shines yellow	Calibration procedure starts
Tracer „start “	briefly pressed	Calibration procedure starts
Tracer „reset“ (in the counter)	Briefly pressed (after reaching the counter value)	Equipment for further Calibration procedure ready



3. Technical data of the equipment

Manufacturer:	Günther Scheliga Gerätebau * Steuerungstechnik * Industrieservice Aachener Str. 79 D-52249 Eschweiler Tel.: 02403 / 838484 Fax: 02403 / 839108 E-mail: info@scheliga-steuerungstechnik.de
Typ:	2013001/00..
Capacity:	50 chips/plate (combi disc) 5 maps with 2, 3 or 4 elements (card disc)
Source:	90Sr / (Y90)
Source activity:	33 Mbq (0.9 mCi)
Dose / Revolution:	40 μ Gy (4mrad) äquivalent 90Co Gammadosis
Max. calibration factor:	10 ⁶ -1
Reproductibility:	< μ Gy (0.1mrad)in 10 cm distance
Mains voltage:	85-264V, 47-63Hz
Micro fuse:	500mA (85-246V)
Battery in the counter:	Lithium buffer batttery with one life span of 10 years
Dimensions:	260 mm x 155 mm x 265 mm (BxHxT)
Weight:	ca. 6,4 Kg

4. Manual

Caution

Please read the manual carefully and completely, before you take the equipment in enterprise!

4.1 Safety precautions

Caution

The equipment corresponds to the relevant safety regulations.

Repairs may be accomplished only by authorized specialists!

Inappropriate repairs can result substantial dangers for the user, for which the manufacturer is not responsible!

If the equipment is purpose-alienated used, the manufacturer takes for this no guarantee!

Attention

Operate the equipment only standing on an even and horizontal surface.

4.2 Operating instructions

In order to serve duly the equipment, **first** is to be clarified it, **which kind of Tld elements** are to be calibrated.

If it concerns **TLD maps**, then the photograph plate is to be used for maps (**card disc**). Five maps can be put, with the map corner outward, on the plate. Two dowel pins prevent that the maps shift during the rotation.



When **TLD chips** and/or **TLD-sticks** are calibrated, you take the plate with the blind holes arranged at the edge (combi disc), into which the elements are to be put down.



Then the thrust subject is put to be pulled out up to the notice and the appropriate plate is put on the thorn. It is to be noted that the follower pin of the equipmentfirm mother board sits in the groove of the plate. Otherwise the plate is to be turned so for a long time, until the pin engages.

4.2.1 Table for calibration factor

The next step consists of stopping by means of the shown table the calibration factor at the counter.

Calibrating Element	Type of plate	Dose / Revolution	Type of net	Source, activity	Calibration factor
Standard Harshaw Typ 3.2x3.2x0.89	combi disc	40 μ Gy (4mrad)	230V, 50Hz	Sr 90, 33MBq	

Note

Calibration data for other dosimeters and/or plates can be determined easily with an TLD-analyzer (e.g. Harshaw model 4000 TLD).

The determined desired value can be entered by the appropriate manipulation of the keys at the counter. After effected input those, the „**reset**” key is to be pressed in order to put the counter exit back.

Input errors can be repaired by the repetition of the procedure.

After effected input of the desired value the calibration process is started by the short manipulation of the push-button „ **start** ”.

At the same time with the start of the engine the source screen is opened by electromagnets. The change of the color the white LED with the designation „**shutter** ”in yellow indicates that the source screen opened duly.

While the counter in the large display indicates the revolutions already accomplished to the calibration, while in the small display the total calibration factor is indicated.

The calibration process is terminated automatically, as soon as the actual value corresponds to the desired value. Those „**shutter**”- LED lights up green and an acoustic signal sounded. This means that the source screen is closed and the carrier disk stands in zero-position.

The acoustic signal can be switched off by the manipulation to that „**reset** ”- key at the counter. At the same time the counter is put back.

4.3 Error recognition and recovery

If the red, lights up „shutter“-LED announcement with the start of the calibration process, the source screen did not open. Repeat the starting process after the equipment were completely switched off. If the Irradiator does not show the desired reaction after renewed switching on and operation of the push-button, please inform the service.

Those, changes „shutter“-LED announcement on red, to the completion of the calibration procedure the source screen was not closed. Usually this error can be repaired by switching off and renewed switching on of the equipment on. Should be nevertheless still indicated after switching on of the errors on, **expressly** it is pointed out that the equipment **may not be opened under any circumstances by unauthorisierem personnel! From the opened radiation source substantial dangers can result, for which the manufacturer is not responsible! Please you contact the service immediately, which then will you inform about the further steps.**

During the calibration process if the thrust subject is opened, the process is interrupted and the source screen is closed. After latches of the thrust subject and press that „start“- key the procedure is continued.

5. Maintenance

This section contains measures and data for maintenance of the equipment.
The equipment is to a large extent maintenance-free implemented.

Caution

The equipment may be waited only by instructed and entitled personnel.
Before opening the equipment it is to be guaranteed that the power supply plug pulled and the equipment is unstressed!

The sealed screws of the source cover may be loosened under no circumstances.
This may be accomplished only by the authorized personnel of the equipment manufacturer!

5.1 Visual check

Examine the equipment on:

- a. outside damage such as notches, tears, deformation, abrasion and corrosion.
- b. bolt connections for tightness.
- c. completeness.
- d. conductions for break and abraded positions as well as for aging of the isolation.
- e. electrical patch cords on damage and corrosion as well as for tightness.

5.2 Cleaning of the equipment

The equipment may be only cleaned with a mild cleaning solution and a dampened cloth. It may not arrive under any circumstances to humidity into the controls.

6. Scope of supply

1 Sr90/Y90 TLD-IRRADIATOR

1 Mains connection line (3m long)

1 Set of fuses (installs)

1 Documentation (CD)

6. Spare parts and part numbers and prices

Designation	Order No.:	€ / Piece
Control card with starting tracer, Power and Shutter – LED For equipment with Seriennr.: 2013001/00..		
Drawer screen with grasp and assembly strip	010203002	
Counter	0102030003	
Shuttermagnet with magnet owner and angle	0102030004	
Source block with threaded insert, screen and Shutter	0102030005	

Designation

Order No.:

€ / Piece

Designation	Order No.:	€ / Piece
Retaining plate with seal catch	0102030006	
Plate with axle and switching solenoid	0102030007	
Bearing flange with sliding bearing and socket	0102030008	
Wheel for plates	0102030009	
Wheel for engine	0102030010	
Toothed belt	0102030011	
Initiator with owner	0102030012	
Sliding plate	0102030013	
Engine with transmission	0102030014	
Exhaust	0102030015	

Designation

Order No.:

€ / Piece

Designation	Order No.:	€ / Piece
Motorcontroller		
Power supply plug with switch and fuse holder	0102030018	
Micro switch	0102030019	
Rails (1 sentence)	0102030021	
Source screw, kompl. with disk and feather/spring	0102030022	
Housing with front screen and rear wall	0102030023	

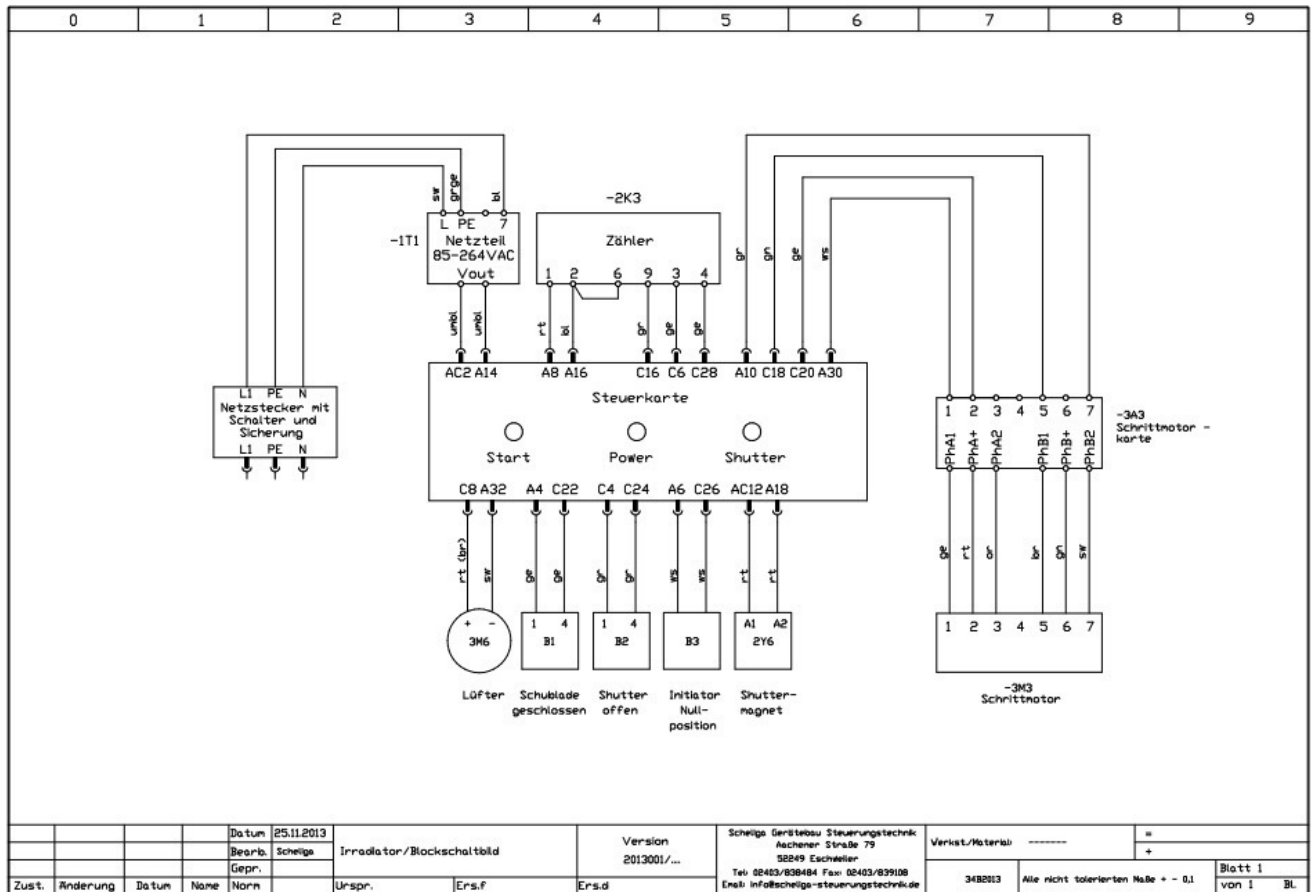
Note!

Plaese consider the serialnumber of the equipment during order of spare parts of the control card!

The positions (sliding plate) and (rails) can only are supplied as unit, and installed by manufacturers.

All rights reserved!

7. Block diagram



B1 Micro switch drawer closed

B2 Micro switch shutter openly

B3 Initiator zero-position

2Y6 Shutter magnet

3M6 equipment fan

3M3 stepper motor

8. EMV test

Inspection station:	Phoenix EMV-Test Königswinkel 10 32825 Blomberg
Information of the test:	Electrical breakdown sending tests Electrical noise immunity tests
<u>Tests based on:</u>	
Breakdown sending:	EN 55022 radiated breakdown sending of 1994 EN 55022 Interference voltage of 1994 The limit values and requirements based on EN 50081-1 of 1992
Noise immunity:	ENV 50140 radiated noise immunity of 8/93 ENV 50141 line-led noise immunity of 8/93 EN 61000-4-2 ESD of 1995 EN 61000-4-4 BURST of 1995 The limit values and requirements based on EN 50082-2 of 1995
Inspection result:	All requirements from the tests where kept by the equipment
Remark:	All examinations to assign the CE indication on the base of EMVG where successfully completed at the time of examination.

8. Equipment inspection VDE 0701

Prüfprotokoll elektrischer Geräte gemäß DIN VDE 0701/0702, BetrSichV, BGV A3				
Auftraggeber		Auftragnehmer		
Scheliga Steuerungstechnik Aachener Str.79 52249 Eschweiler		Scheliga Steuerungstechnik Aachener Straße 79 52249 Eschweiler		
				
Angaben zum Prüfling				
Prüflingsbezeichnung:	Irradiator 2013	Typenbezeichnung:	Sr90/Y90 Irradiator	
Prüflingsnummer:	2013001/00..	Geräteart:	Kleingerät	
Fabriknummer:	2013001/00..	Baujahr:	2013	
Typ:	Allg. elektrische Geräte der SKI (Rpe- Messung mit 200mA) (Kopie)	Strom:	0,17A bei 230V	
Schutzklasse:	I	Spannung:	85-264V 47-63Hz	
Prüfcode (8993):	2862400D00	Leistung:	18,0W	
Hersteller:	Scheliga Steuerungstechnik			
Abteilung:	Irradiatoren			
Angaben zur Prüfung				
Prüfdatum:	30.09.2013	Nächste Prüfung:	30.09.2014	
Prüfgrund:	Erstprüfung	Seriennummer:	92730053	
Prüfer:	Stefan Scheliga			
Prüfgerät:	Telaris			
Bemerkung	Prüfschritt	Grenzwert	Messwert	Bestanden
	Sichtprüfung für Gerät und Zuleitung			ja
	PE-Widerstand ± 200 mA [0,3 Ohm], bis 5 m	Max. 0,3 Ohm	0,10 Ohm	ja
	Zuleitung			ja
	Isolationsprüfung 500 V [1,0 MOhm]	Min. 1 MOhm	>250 MOhm	ja
	Ersatzableitstrom [3,5 mA]	Max. 3,5 mA	0,23 mA	ja
	Berührungsstrom [0,5 mA]	Max. 0,5 mA	<0,010 mA	ja
Die Prüfung wurde ordnungsgemäß durchgeführt. Die Prüfung wurde bestanden.				
<i>Erhebt</i> 30.9.2013 Ort, Datum		STEUERUNGSTECHNIK / INDUSTRIESERVICE / GERÄTEBAU GÜNTHER SCHELIGA AACHENER STRASSE 79 D 52249 ESCHWEILER TELEFON: +49 (0) 2403 / 83 84 84 +49 (0) 2403 / 83 91 08 E-MAIL: INFO@SCHELIGA-STEUERUNGSTECHNIK.DE Unterschrift		

TLD-Map opener / TLD-Holderopener

To open the dosimeter maps is offered a map opener.

The map opener makes fast access possible to the TLD crystals by automatic opening of the maps.

Further information on request.



